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Spectroscopic and Meridional Observations of Coggia's Comet (III. 1874), made at the Royal Observatory, Greenwich.

(*Communicated by the Astronomer Royal.*)

The following spectroscopic observations of the comet were made by Mr. Christie:—

The comet was examined with a dispersive power of one compound prism (dispersion A to H $7\frac{1}{2}^\circ$) and of two compound prisms, the spectroscope used being adapted to the Great Equatoreal. In the first case a plane reflector was used, to send the rays directly back after passing through the first half prism of the train (which consists of a half prism, four whole prisms, and another half prism silvered on the back, all compound); in the other case, the half prism silvered on the back was placed to receive the rays after passing through the first half prism. The spectrum of the comet was examined on July 3, 4, 7, 12, 13, and 14, and compared with the spectrum of dioxide of carbon, a vacuum tube containing it, being placed in the telescope two feet from the slit, the plan used by Dr. Huggins in his Stellar and Nebular observations. The spark was obtained from an induction coil, without a Leyden jar, and under these conditions the spectrum was very similar to that of the comet, consisting of three or more bright bands, on a continuous spectrum, which, with a slight change in the spark, became so bright as nearly to obliterate the bands. In the spectrum of the comet two bright bands were found by direct comparison on every occasion to be sensibly co-incident with the two brighter bands of dioxide of carbon; the position of the third band was not determined. All these bands were sharply terminated on the red side, and faded away gradually towards the blue, becoming at the same time shorter, in the direction transverse to the continuous spectrum. On July 7 the coma gave in addition to these bands a faint continuous spectrum, which afterwards seemed to become much brighter, so that the bands were quite obliterated on July 14; but this may have been caused by the twilight and haze as the comet approached the horizon. The spectrum of the nucleus was continuous, but it appeared to have traces of numerous bright bands, and three or four dark lines also were seen on several occasions, but owing to passing clouds they were lost before their positions could be determined. One appeared to lie between D and E, another on the blue side of *b*, and a third near F. On July 14 another strip of continuous spectrum was seen to the east of that of the nucleus, corresponding to the brighter side of the coma.

The nucleus on June 22 and July 6 was planetary, about 5″ in diameter; afterwards it seemed to contract and become nearly stellar.

The tail and coma were found to be partially polarised in a plane through the axis of the tail on July 3, 6, 7, and 13, a doubly

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refracting prism being used; the polarisation of the tail appeared to be slightly greater than that of the coma.

The following naked-eye observations of the brightness of the nucleus and length of the tail were made:—

June 22. Nucleus brighter than ✻ 5 mag. Tail about 3° long.
July 3. Nucleus considerably brighter than *o Ursæ Majoris*. Tail about 5°.
July 4. Tail about 7°.
July 5. Tail about 12° long, 2° broad at base, extending to 27 *Ursæ Majoris*.
July 6 and 7. Tail about 15° long.
July 8. Nucleus = *β Ursæ Majoris* and < *α Ursæ Majoris*. Tail 16° or 17°.
July 9. Nucleus > *β Ursæ Majoris* but < *α Ursæ Majoris*.
July 12. Nucleus > *α Ursæ Majoris* or *α Persei*, perhaps = *α Aquilæ*. Tail extended fully up to *o Ursæ Majoris*.
July 13. Nucleus nearly = *Capella* at about same altitude > *α Ursæ Majoris* which was 25° higher, and also > *α Aquilæ*. Tail nearly 20° long.

The comet was also observed on the meridian with the Transit-circle on every available opportunity. The following are the resulting observed right ascensions and north polar distances, corrected for parallax:—

1874		Greenwich M.S.T.	Observed R.A.	Observed N.P.D.
		h m s	h m s	° ′ ″
June	22	13 18 1·4	7 22 12·17	21 51 49·3
	24	13 13 38·7	7 25 41·87	22 17 26·8
July	1	12 56 54·1	7 36 30·40	25 10 29·3
	3	12 51 31·9	7 39 0·51	26 36 18·7
	4	12 48 45·5	7 40 10·14	27 28 4·9
	6	12 42 57·3	7 42 14·14	29 32 41·5
	7	12 39 56·6	7 43 9·47	30 47 35·6
	8	12 36 51·7	7 44 0·68	32 12 36·3
	12	12 23 55·5	7 46 48·56	39 50 15·7

Royal Observatory, Greenwich,
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The Plate given with the present number belongs to Mr. Knobel's paper, "Observations of Jupiter, 1874," No. 8, pp. 403–409.

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